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AF/3724

Docket No.: HEM 99/607 (HA-2911)

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MAIL STOP: APPEAL BRIEF-PATENTS

By: _____ Date: April 23, 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

Applic. No.	:	09/758,299 Confirmation No.: 9699
Inventor	:	David Clarke Pollock et al.
Filed	:	January 10, 2001
Title	:	Helical Cutting Unit and Method of Operating the Same
TC/A.U.	:	3724
Examiner	:	Jason D. Prone
Customer No.	:	**24131**

Hon. Commissioner for Patents
Alexandria, VA 22313-1450

BRIEF ON APPEAL

S i r :

This is an appeal from the final rejection in the Office action dated December 4, 2003, finally rejecting claims 1, 5, 7-11 and 22-24.

Appellants submit this *Brief on Appeal* in triplicate, including payment in the amount of $330.00 to cover the fee for filing the *Brief on Appeal*.

04/28/2004 MAHMED1 00000052 09758299
01 FC:1402 330.00 OP

04/28/2004 MAHMED1 00000052 09758299
02 FC:1251 110.00 OP

Real Party in Interest:

This application is assigned to Heidelberger Druckmaschinen AG of München, Germany. The assignment will be submitted for recordation upon the termination of this appeal.

Related Appeals and Interferences:

No related appeals or interference proceedings are currently pending which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims:

Claims 1, 5, 7-11 and 22-24 are rejected and are under appeal. Claim 25 has been cancelled in an amendment filed on September 30, 2003. Claims 2-4, 6 and 12-21 were cancelled in an amendment filed on October 3, 2002.

Status of Amendments:

No claims were amended after the final Office action. *A Notice of Appeal* was filed on February 12, 2004.

Summary of the Invention:

As stated in the first paragraph on page 1 of the specification of the instant application, the invention relates to a cutting unit, and more specifically, to a printing system or folder incorporating the cutting unit.

Appellants explained on page 6 of the specification, line 24, that, in all the figures of the drawing, sub-features and integral parts that correspond to one another bear the same reference symbol in each case. Referring now to the figures of the drawings in detail and first, particularly, to Fig. 1 thereof, there is shown a cutting unit for cutting a ribbon 1 such as a ribbon of paper. The cutting unit includes a pair of cylinders including a first cutting cylinder 2 disposed above the ribbon 1 and a second cylinder 3 disposed below the ribbon 1. The first cutting cylinder 2 has on its periphery a helically configured cutting knife 4. The second cylinder 3 may be a blank cylinder, have a mating anvil or be formed of "cutting rubber". A gap is formed between the cylinders 2, 3 which gap receives the ribbon 1.

It is set forth on page 7 of the specification, line 12, that the cylinders 2, 3 are oriented at an angle α to the ribbon 1, and the cylinders 2, 3 are driven or rotated by drives 5, 5' at a speed proportional to a speed of the ribbon 1. As the cylinders rotate 2, 3, a point of contact (i.e. a point of cutting) between the cylinders 2, 3 travels across a width of the ribbon 1 and also in a direction of travel 7 of the ribbon 1 due to helical configuration of the cutting knife 4. In order to cut the ribbon 1 in a straight line, the

proportionality constant of rotation of the cylinders 2, 3 is chosen such the component of travel of the point of contact in the direction of travel 7 of the ribbon 1 exactly matches the speed of the ribbon 1. The drives 5, 5' are in turn controlled by a control unit 6 that may be part of the cutting unit, a folder that incorporates the cutting unit or the printing system that incorporates the cutting unit. The drives 5, 5' may be motors, gears driven by a motor, a belt and pulley system, etc.. The control unit 6 is a microprocessor based control system.

Appellants outlined on page 8 of the specification, line 5, that, when a different cut-to-cut length of the ribbon 1 is required by the printing system, the angular orientation α of the cylinders 2, 3 relative to the ribbon 1 is changed. In addition, the proportionality constant of rotation of the cylinders 2, 3 is adjusted so that the component of travel of the point of contact in the direction of travel 7 of the ribbon 1 still matches the speed of the ribbon 1.

Appellants further outlined on page 8 of the specification, line 13, that, if the angle α of the cylinders 2, 3 in relationship to the ribbon 1 is decreased (the cylinders 2, 3 are oriented more parallel to the ribbon 1), the cylinders 2, 3 are rotated faster for a given press speed to maintain a

straight cut. Reorienting the cylinders 2, 3 in this direction results in a longer cut-to-cut length of the ribbon 1. On the other hand, if the angle α of the cylinders 2, 3 in relationship to the ribbon 1 is increased (the cylinders 2, 3 are oriented less parallel to the ribbon 1), the cylinders 2, 3 are rotated slower for a given press speed to maintain a straight cut. Reorienting the cylinders 2, 3 in this direction results in a shorter cut-to-cut length of the ribbon 1.

It is stated on page 9 of the specification, line 1, that, in Fig. 2, the cylinders 2, 3 are oriented more parallel to the ribbon 1. Therefore the cut-to-cut length of the ribbon 1 is changed by an amount δ.

As further set forth on page 9 of the specification, line 5, Fig. 3 shows a side view of a subframe 9 of the cutting unit that is in turn housed in a frame 10 of a folder. The subframe 9 and the frame 10 are only diagrammatically shown in the drawing. The subframe 9 houses the drives 5, 5' which in turn mount and rotate the cylinders 2, 3. In Fig. 3 the drives 5, 5' and the cylinders 2, 3 are not visible as they reside on the other side of the subframe 9. The subframe 9 is pivotable with regards to the frame 10 and therefore, the cylinders 2, 3 can be pivoted in regards to the ribbon 1 and

the angle α can be controlled by the location of the subframe 9 to the frame 10. The subframe 9 has a pivot point 11 about which it can be driven by a drive or cylinder 12 such as an air cylinder or a hydraulic cylinder. In addition, the subframe 9 can be pivotably mounted with the frame 10 in a ball and screw fashion. It is noted that many manners of mounting the subframe 9 to frame 10 are known and any pivotable manner is acceptable and the two forms discussed are only examples of many possibilities.

Appellants explained in the last paragraph on page 9 of the specification, line 24, that sensors 8 are disposed in the travel path of the ribbon 1 and are connected to the control unit 6 for monitoring the cutting operation of the ribbon 1 (only one of the sensors is shown to be connected to the control unit for clarity reasons). The sensors 8 provide data to the control unit 6 for adjusting the cutting operation of the ribbon 1. Should the sensors 8 detect an unacceptable cut, the control unit 6 can adjust the rotational speed of the cylinders 2, 3 via the drives 5, 5' or adjust the angle α. In addition, the sensors 8 can detect a faulty operation of the cutting unit and instruct the shutdown of the cutting unit. The sensors 8 can be cameras, scanners, speed sensors, optical scanners, etc..

As stated on page 10 of the specification, line 12, the nature of the cutting process represents two of the virtues of the invention. First, and unlike most folders that cut all at once between the rotating cylinders, the cutting process can be spread over as much time as desired. This greatly reduces the impulse forces that are created and transmitted back through the cutting unit and the printing system. The impulse forces having a disruptive effect on other printing processes including the registration of the cut to the print on the ribbon 1. Second, the protracted cutting can be done using blades that produce a clean, unserrated cut. Therefore, no further additional finishing steps are necessary (i.e. cutting away the serrated cut in the prior art). This results in savings in that no additional cutting equipment is necessary, paper waste is reduced, and the printing process is quicker.

References Cited:

U.S. Patent No. 4,014,234 (Spengler), dated March 29, 1977;

U.S. Patent No. 4,053,004 (Barwise et al.), dated October 11, 1977;

U.S. Patent No. 5,526,726 (Shore et al.), dated June 18, 1996;

Issues

1. Whether or not claims 1, 5, 7-11, and 22-25 are obvious over Spengler (U.S. Patent No. 4,014,234) in view of Shore et al. (U.S. Patent No. 5,526,726) (hereinafter "Shore") and in view of Barwise et al. (U.S. Patent No. 4,053,004) (hereinafter "Barwise") under 35 U.S.C. §103.

2. Whether or not the references Spengler, Shore, and Barwise can be properly combined under 35 U.S.C. §103.

Grouping of Claims:

Claims 1 and 10 are independent. Claims 5, 7-9, and 22-25 depend on claim 1 and claim 11 depends on claim 10. The patentability of claims 5, 7-9, 11, and 22-25 are not separately argued. Therefore, claims 5, 7-9, 11, and 22-25 stand or fall with claims 1 and 10.

Arguments:

1. Claims 1, 5, 7-11, and 22-25 are not obvious over Spengler in view of Shore and Barwise

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claims 1 and 10 call for, *inter alia*:

a sensor disposed in the travel path of the ribbon and monitoring the cutting operation of the ribbon, the sensor connected to the control unit, and the sensor providing control signals to the control unit for controlling operation of the cylinders.

The Spengler reference discloses a cutting apparatus that does not include a sensor.

The Shore reference discloses a high-speed shear for end trimming rods.

The Examiner has incorrectly stated in items 3 and 4 of the final Office action dated December 4, 2003 that "Shore et al. discloses a sensor, connected to the control unit and disposed in the travel path of the work piece, providing control signals to the control unit for controlling…(column 1, lines 15-26)." Column 1, lines 15-26 of Shore refers to prior art that is directed to intermittently operable shears, which necessarily require complex control systems which precisely position the shear blades during each cut in response to rod end position signals generated by sensors located along the rolling line. Therefore, the sensors disclosed in Shore **only pertain** to the prior art disclosed in Shore. This is

supported by the fact that Shore discloses that an objective of his invention is the provision of a continually operating shear which inherently makes a single cut in response to diversion of the product from its normal path of travel, and **which does not require a rod end position signal** to coordinate actuation of tile shear blades (column 1, lines 44-49). Therefore, Shore specifically teaches that his invention does not need sensors.

The Barwise reference does not disclose any sensors.

It is a requirement for a *prima facie* case of obviousness, that the prior art references must teach or suggest **all** the claim limitations.

The references do not show or suggest a sensor disposed in the travel path of the ribbon and monitoring the cutting operation of the ribbon, the sensor connected to the control unit, and the sensor providing control signals to the control unit for controlling operation of the cylinders, as recited in claim 1 of the instant application.

The references applied by the Examiner **do not** teach or suggest **all** the claim limitations. Therefore, the Examiner has not produced a *prima facie* case of obviousness.

Applicants respectfully believe that any teaching, suggestion, or incentive possibly derived from the prior art is only present with hindsight judgment in view of the instant application. "It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. . . . The references **themselves** must provide some teaching whereby the applicant's combination would have been obvious." In re Gorman, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (emphasis added). Here, no such teaching is present in the cited references.

The Spengler reference discloses the actuation of clutches and brakes so that the cutting cylinder is positively driven for predetermined durations on a once per product basis to achieve control of the length of the resulting product (column 2, 42-47). The reference further discloses a journal shaft (29) to which a cutting roller is tiltably secured in such a manner that the cutting roller may be tilted or journaled about the journal shaft by a journal drive (45), whereby the cutting roller may be adjusted into a different operating position **after each cutting operation** (column 2, lines 48-55). Furthermore, Spengler discloses that the cutting roller is only operated when a cut is to be performed while the counter

pressure roller is continuously driven to continuously feed or advance the sheet material to be cut in a given direction. This type of operation is possible because the strip steel knives attached to the cutting roller **do not extend all around the entire circumference of the cutting roller,** so that portions of the circumference of the cutting roller are not provided with any cutting knives (column 2, lines 32-41).

The Spengler reference does not disclose that it is possible to use the angular position of the cylinders in combination with an adjustment of the angular velocity of the cylinders relative to the velocity of the web of material to achieve cut edges that will be perpendicular to the direction of web travel at all times and at the same time allow production of signatures with any desired length within a range.

2. The combination of Spengler, Shore and Barwise is not proper

The operation of the device according to Spengler is possible because the strip steel knives attached to the cutting roller **do not extend all around the entire circumference of the cutting roller,** so that portions of the circumference of the cutting roller are not provided with any cutting knives (column 2, lines 32-41). Accordingly, supplying the device of

Spengler with a helical blade as disclosed in Barwise would destroy the function of the cutting operation taught by Spengler. Therefore, a person of ordinary skill in the art would not use the helical blade disclosed in Barwise to modify the cutting roller of Spengler.

Furthermore, the Barwise reference pertains to a machine that severs elongated wood particles or fiber masses in one self-feeding and continuous operation. In order to achieve the severing of the wood particles Barwise discloses that a rotating spiral cutting edge is mounted on a drive shaft and has a varying radial length which increases from zero on one end to a radial length that is greater than the cross sectional dimension of the wood to be sheared (abstract). Barwise discloses that the drive shaft on which the helical blade is mounted, is parallel to the longitudinal axis and the feed direction of the elongated wood particles to be cut (Fig. 1).

The Spengler reference teaches away from the combination with the teaching of Barwise for the following reasons:

First, the Spengler reference has a blade with a constant radial length. Barwise discloses that the spiral cutting edge is mounted on a drive shaft and has a varying radial length.

Therefore, the Spengler reference teaches away from the use of the helical blade as disclosed in Barwise.

Also, the Spengler reference discloses that the cutting roller is disposed substantially perpendicular to the feed direction and the longitudinal axis of the sheet to be cut. This is contrary to Barwise, in which the drive shaft on which the helical blade is mounted, is parallel to the longitudinal axis and the feed direction of the elongated wood particles to be cut.

Based on the above-provided reasons, the Spengler reference teaches away from the combination with Barwise.

Furthermore, the disclosure in column 1, lines 15-26 of the Shore reference pertains to intermittently acting tile shears, of the prior art and not to Shore's device. The prior art disclosed in Shore has no relationship to the cutting apparatus disclosed in Spengler, which includes a cutting roller. The sensors disclosed in the prior art of Shore are provided for positioning the intermittently acting tile shears. Because Spengler does not require a locating of cutting blades with respect to a sheet to be cut, a person of ordinary skill in the art does not have any motivation to

combine the teaching of Spengler with the teaching of the prior art disclosed in Shore.

As seen from the above-given comments the combination of Spengler, Shore, and Barwise is not proper.

Based on the above-given arguments, the honorable Board is therefore respectfully urged to reverse the final rejection of the Primary Examiner.

Petition for extension is herewith made. The extension fee for response within a period of one month pursuant to Section 1.136(a) in the amount of $110 in accordance with Section 1.17 is enclosed herewith.

Respectfully submitted,

Alfred K. Dassler
52,794

For Appellants

AKD/bb

Date: April 23, 2004
Lerner and Greenberg, P.A.
Post Office Box 2480
Hollywood, Florida 33022-2480
Tel: (954) 925-1100
Fax: (954) 925-1101

Appendix - Appealed Claims:

1. A cutting unit, comprising:

a pair of cylinders disposed opposite one another with a gap formed there-between for receiving a ribbon on a travel path, said pair of cylinders including a first cutting cylinder having a periphery with a cutting knife disposed helically about said periphery and a second cylinder;

one drive rotating said first cutting cylinder for cutting the ribbon and providing a signature cut from the ribbon with a smooth, straight edge;

a subframe having a pivot point, said subframe being pivotable about said pivot point, said subframe supporting said cylinders, and said subframe controlling a position of said cylinders in regard to the ribbon and therefore controlling a cutting length of the ribbon;

a further drive connected to said subframe for pivoting said subframe about said pivot point;

a control unit connected to and controlling said further drive and said one drive for controlling a rotational speed of said first cutting cylinder; and

a sensor disposed in the travel path of the ribbon and monitoring the cutting operation of the ribbon, said sensor connected to said control unit, and said sensor providing control signals to said control unit for controlling operation of said cylinders.

5. The cutting unit according to claim 1, wherein said one drive is a first drive, and including a second drive rotating and mounting said second cylinder, said first drive and said second drive are supported by said subframe.

7. The cutting unit according to claim 1, wherein said one drive is a first drive, a second drive rotates and mounts said second cylinder, and said first drive and said second drive are motors.

8. The cutting unit according to claim 1, wherein said one drive is a first drive, a second drive rotates and mounts said second cylinder, and said first drive and said second drive are gears to be driven by motors.

9. The cutting unit according to claim 6, wherein said sensor is selected from the group consisting of cameras,

optical scanners, speed sensors, and position sensors, and said control unit is a microprocessor based control unit.

10. A folder, comprising:

a frame;

a subframe pivotably mounted in said frame about a pivot point;

one drive housed in said subframe;

a pair of cylinders supported by said subframe and disposed opposite one another with a gap formed there-between for receiving a ribbon on a travel path, said pair of cylinders including a first cutting cylinder having a periphery with a cutting knife disposed helically about said periphery and a second cylinder, said first cutting cylinder driven by said one drive for cleanly cutting the ribbon and providing a signature cut from the ribbon with a smooth, straight edge;

said subframe controlling a position of said cylinders in regard to the ribbon and therefore controlling a cutting length of the ribbon;

a further drive connected to said subframe for pivoting said subframe about said pivot point;

a control unit connected to and controlling said further drive and said one drive for controlling a rotational speed of said first cutting cylinder; and

a sensor disposed in the travel path of the ribbon and monitoring the cutting operation of the ribbon, said sensor connected to said control unit, and said sensor providing control signals to said control unit for controlling operation of said cylinders.

11. The folder according to claim 10, wherein said one drive is a first drive and including a second drive rotating and mounting said second cylinder, said first drive and said second drive rotating said cylinders such that a component of travel of a point of contact between said cylinders in a direction of travel of the ribbon matches a speed of the ribbon for cutting the ribbon in a straight line.

22. The cutting unit according to claim 1, wherein said sensors provide control signals to said control unit to maintain an acceptable cut of the ribbon by adjustment of the

rotational speed of said cylinder drives, or by adjustment of said further drive pivoting said subframe.

23. The cutting unit according to claim 1, wherein said sensors detect an unacceptable cut of the ribbon, and said control unit adjusts the rotational speed of the cylinders by adjusting the drives.

24. The cutting unit according to claim 1, wherein said sensors detect an unacceptable cut of the ribbon, and said control unit adjusts the rotational speed of the cylinders by controlling the position of said cutting cylinders.